

Appl. No. 10/895,524
Reply to Office action of 07/05/2005

Applicant respectfully submits that claim 1 is unanticipated by Tran et al as there is no disclosure or suggestion in Tran of forming a HDP liner layer over a semiconductor body having metal leads formed thereon, wherein a portion of the HDP liner layer over the metal leads has sloped edges, forming a gap-fill layer over the liner layer, and forming a dielectric layer over the gap-fill layer and the metal leads, as required by claim 1. Tran teaches an HDP layer 42 over metal leads 14 and 41. While FIG. 4 of Tran, taken alone, might give the appearance that layer 42 is a liner layer, the text at Col. 6 lines 23-66, clarify that HDP layer 42 is a gap-filling layer (e.g., "Gaps between the metal features are filled with a layer of HDP oxide 42."). Tran does not teach an HDP liner layer plus a gap-fill layer plus a dielectric layer. The HDP layer of Tran is taught as the gap-fill layer. There is no liner taught in addition to the gap-fill layer. Accordingly, Applicant respectfully submits that claim 1 and the claims dependent thereon are unanticipated by Tran.

The Examiner rejected claims 2, 5, 6 and 7 under 35 U.S.C. § 103(a) as being unpatentable over Tran et al. (U.S. Patent 6,046,106) as applied to claims 1 and 8 above, and further in view of Lee (U.S. Patent 6,197,691).

Applicant respectfully submits that claims 2, 5, 6, and 7 are patentable over Tran et al in view of Lee as there is no disclosure or suggestion in the references of forming a HDP liner layer over a semiconductor body having metal leads formed thereon, wherein a portion of the HDP liner layer over the metal leads has sloped edges, forming a gap-fill layer over the liner layer, and forming a dielectric layer over the gap-fill layer and the metal leads, as required by claim 1 from which these claims depend. As discussed above, Tran fails to teach or suggest an HDP liner layer plus a gap-fill layer plus a dielectric layer. Lee is added to teach that an etch-dep ratio resulting in a 45 degree angle is suitable for gap filling and the pyramidal and trapezoidal shapes of an HDP gap-fill layer. The combined references do not disclose or suggest forming a HDP liner layer, wherein a portion of the HDP liner layer over the metal leads has sloped edges, forming a gap-fill layer over the liner layer, and forming a dielectric layer over the gap-fill layer and the metal leads.

Appl. No. 10/895,524
Reply to Office action of 07/05/2005

Furthermore, while Lee teaches a 45 degree angle as being suitable for gap-filling and the pyramidal and trapezoidal shapes in a gap-fill layer, there is no suggestion for applying these elements to an HDP liner layer located below a gap-filling layer and a dielectric layer. Lee only suggests applying these to the gap-filling layer itself as opposed to a liner layer as claimed. Accordingly, Applicant respectfully submits that claims 2, 5, 6, and 7 are patentable over the references.

The Examiner rejected claims 3, 4, 10 and 11 under 35 U.S.C. § 103(a) as being unpatentable over Tran et al. (U.S. Patent 6,046,106) as applied to claims 1 and 8 above, and further in view of Wolf, Vol. 2.

Applicant respectfully submits that claims 3, 4, 10, and 11 are patentable over the references for the same reasons discussed above relative to claim 1, from which these claims depend.

The Examiner rejected claim 9 under 35 U.S.C. § 103(a) as being unpatentable over Tran et al. (U.S. Patent 6,046,106) as applied to claims 1 and 8 above, and further in view of Tsai et al.

Applicant respectfully submits that claim 9 is patentable over the references for the same reasons discussed above relative to claim 1, from which this claim depends. Tsai is added to teach an HDP oxide using F doped oxide.

The Examiner rejected claim 12 under 35 U.S.C. § 103(a) as being unpatentable over Tran et al. (U.S. Patent 6,046,106) as applied to claims 1 and 8 above, and further in view of AAPA.

Applicant respectfully submits that claim 12 is patentable over the references for the same reasons discussed above relative to claim 1, from which this claim depends. The AAPA is applied to teach HSQ as an interlevel dielectric layer.

Appl. No. 10/895,524
Reply to Office action of 07/05/2005

In light of the above, Applicant respectfully requests withdrawal of the Examiner's rejections and allowance of claims 1-12. If the Examiner has any questions or other correspondence regarding this application, Applicant requests that the Examiner contact Applicant's attorney at the below listed telephone number and address.

Respectfully submitted,



Jacqueline J. Garner
Reg. No. 36,144

Texas Instruments Incorporated
P. O. Box 655474, M.S. 3999
Dallas, Texas 75265
Phone: (214) 532-9348
Fax: (972) 917-4418